

C

1. Drop Terminal Dispersion

PrimDist.pas

Original Code

```
467 procedure get_lines( GR      : GridRecordType_ptr;
468                      density   : double;
469                      row       : integer;
470                      col       : integer;
471                      NS_lots   : integer;
472                      EW_lots   : integer;
473                      *
474                      *
475                      *
476                      line_vector^n] := factor*lines_per_lot;
477
478                      x^n] := GR^LowerLeftX + (col-1)*GR^MicroGridEW + i*(one/EW_lots);
479                      y^n] := GR^LowerLeftY + (row-1)*GR^MicroGridNS + j*(one/NS_lots);
480
481                      tmp := structure_cost_fn(line_vector^n],0,density,GR^.hardness,GR^.DepthToBedrock,
```

Modified Code

```
467 procedure get_lines( GR      : GridRecordType_ptr;
468                      density   : double;
469                      row       : integer;
470                      col       : integer;
471                      NS_lots   : integer;
472                      EW_lots   : integer;
473                      *
474                      *
475                      *
476                      line_vector^n] := factor*lines_per_lot;
477
478                      x^n] := GR^LowerLeftX + (col-1)*GR^MicroGridEW + i*(GR^.MicroGridEW/EW_lots);
479                      y^n] := GR^LowerLeftY + (row-1)*GR^MicroGridNS + j*(GR^.MicroGridNS/NS_lots);
480
481                      tmp := structure_cost_fn(line_vector^n],0,density,GR^.hardness,GR^.DepthToBedrock,
```

2. Drop Terminal Orientation

PrimDist.pas

Original Code

```

467 procedure get_lines( GR      : GridRecordType_ptr;
468           density   : double;
469           row       : integer;
470           col       : integer;
471           NS_lots   : integer;
472           EW_lots   : integer;
473           *
474           *
475           *
530   line_vector^n] := factor*lines_per_lot;
531
532   x^n] := GR^LowerLeftX + (col-1)*GR^MicroGridEW + i*(one/EW_lots);
533   y^n] := GR^LowerLeftY + (row-1)*GR^MicroGridNS + j*(one/NS_lots);

```

Modified Code

```

467 procedure get_lines( GR      : GridRecordType_ptr;
468           density   : double;
469           row       : integer;
470           col       : integer;
471           divider_row : integer;
472           divider_col : integer;
473           NS_lots   : integer;
474           EW_lots   : integer;
475           *
476           *
477           *
530   line_vector^n] := factor*lines_per_lot;
531
531   if(row<=divider_row) and (col<=divider_col) then
begin
      x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + i*(one/EW_lots);
      y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + j*(one/NS_lots);
end;
if(row<=divider_row) and (col>divider_col) then
begin
      x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + (EW_lots-i)*(one/EW_lots);
      y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + j*(one/NS_lots);
end;
if(row>divider_row) and (col<=divider_col) then
begin
      x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + i*(one/EW_lots);
      y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + (NS_lots-j)*(one/NS_lots);
end;
if (row>divider_row) and (col>divider_col) then
begin
      x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + (EW_lots-i)*(one/EW_lots);
      y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + (NS_lots-j)*(one/NS_lots);
end;
534
535   tmp := structure_cost_fn(line_vector^n],0,density,GR^.hardness,GR^.DepthToBedrock,

```

2. Drop Terminal Orientation *Continued*

PrimDist.pas

Attachment C
Page: 3 of 8

<u>Original Code</u>	<u>Modified Code</u>
<pre> * * * 573 procedure calculate_prim_distribution_cost(* * * 616 var i : integer; 617 j : integer; 618 n : integer; 619 num_terms : integer; 620 k : integer; 621 midx : double; 622 midy : double; * * * 695 n := 1; 696 697 for i := 1 to GR^.nrow do 698 for j := 1 to GR^.ncol do 699 if (flag^[i,j]=k) and (lines^[i,j]>zero) then 700 begin 701 lots := round(GR^.ResLines[i,j]/GR^.lines_per_house) + 702 round(GR^.BusLines[i,j]/GR^.lines_per_bus); 703 704 lot_divide(lots,NS_lots,EW_lots); 705 706 get_lines(GR, density, i, j, round(NS_lots), round(EW_lots), lines^[i,j], n, line_vector, 707 x, y, grid_dropterm_cost, grid_nid_cost, grid_drop_cost, grid_drop_feet); 708 709 prim_drop_cost := prim_drop_cost + grid_drop_cost; </pre>	<pre> * * * 573 procedure calculate_prim_distribution_cost(* * * 616 var i : integer; 617 j : integer; 618 n : integer; 619 num_terms : integer; 620 k : integer; 621 divider_row : integer; 622 divider_col : integer; 623 midx : double; 624 midy : double; * * * 695 n := 1; 696 697 for i := 1 to GR^.nrow do 698 for j := 1 to GR^.ncol do 699 if (flag^[i,j]=k) and (lines^[i,j]>zero) then 700 begin 701 lots := round(GR^.ResLines[i,j]/GR^.lines_per_house) + 702 round(GR^.BusLines[i,j]/GR^.lines_per_bus); 703 704 lot_divide(lots,NS_lots,EW_lots); 705 706 get_lines(GR, density, i, j, divider_row, divider_col, round(NS_lots), round(EW_lots), 707 lines^[i,j], n, line_vector, x, y, grid_dropterm_cost, grid_nid_cost, 708 grid_drop_cost, grid_drop_feet); 709 prim_drop_cost := prim_drop_cost + grid_drop_cost; </pre>

3. Lot Size / Configuration

Lot_Div.pas

Original Code

```
018 procedure lot_divide(
*
*
*
054     NS_try_d := number_of_lots/EW_try ;
055     NS_try := round(NS_try_d);
056     waste := NS_try*EW_try - number_of_lots;
057     if (waste < 0) then waste := number_of_lots;
058     if (waste <= minwaste) then
059     begin
```

Modified Code

```
018 procedure lot_divide(
*
*
*
054     NS_try_d := number_of_lots/EW_try ;
055     NS_try := round(NS_try_d);
056     while (EW_try*NS_try < number_of_lots) do NS_try := NS_try + 1;
057     waste := NS_try*EW_try - number_of_lots;
058     if (waste < 0) then waste := number_of_lots;
059     if (waste <= minwaste) and (2*EW_try >= NS_try) and (2*NS_try >= EW_try) then
begin
```

4. Input Variables

Globals.pas

Original Code

```
950     readln(infile,
951         Sharing[i]^Density, Sharing[i]^bur_share,
952         Sharing[i]^ugd_share,Sharing[i]^aer_share);
```

Modified Code

```
950     readln(infile,
951         Sharing[i]^Density, Sharing[i]^ugd_share,
952         Sharing[i]^bur_share,Sharing[i]^aer_share);
```

Structur.pas

Original Code

```
267 then manhole_cost := ManholeCost[i]^HardCost/ManholeSpacing; { manhole
cost per foot for underground}
*
304 then manhole_cost := ManholeCost[i]^NormalCost/ManholeSpacing; { manhole
cost per foot for underground}
*
340 then manhole_cost := ManholeCost[i]^SoftCost/ManholeSpacing; { manhole
cost per foot for underground}
```

Modified Code

```
267 then manhole_cost := ManholeCost[i+1]^HardCost/ManholeSpacing { manhole cost per foot
for underground}
*
304 then manhole_cost := ManholeCost[i+1]^NormalCost/ManholeSpacing; { manhole cost per
foot for underground}
*
340 then manhole_cost := ManholeCost[i+1]^SoftCost/ManholeSpacing; { manhole cost per foot
for underground}
```

Tech.pas

Original Code

```
146 then tmp3 := IntfcCost[n]^cost;
```

Modified Code

```
146 then tmp3 := IntfcCost[n+1]^cost;
```

Terminal.pas

Original Code

```
258 begin
259     temp := pct_ugd*DropTermCost[i]^CostUgd +
260             pct_bur*DropTermCost[i]^CostBur +
261             pct_aer*DropTermCost[i]^CostAer;
262 end;
```

Modified Code

```
258 begin
259     temp := pct_ugd*DropTermCost[i+1]^CostUgd +
260             pct_bur*DropTermCost[i+1]^CostBur +
261             pct_aer*DropTermCost[i+1]^CostAer;
262 end;
```

5. Residual Line Allocation

ClusIntf.pas

```

0558  d1      : double;
0559  d2      : double;
0560  dr1     : double;
0561  nr1     : integer;

0562
0563  begin
*
*
*
0791    GR^.ResLines[i,j] := 0;
0792    GR^.BusLines [i,j] := 0;
0793    bpop[i,j] := false;
0794    rpop[i,j] := false;

0795  end;
*
*
*
0800    j := round( abs(x^[k] - llx) / RasterSize + half );
0801
0802    GR^.ResLines[i,j] := GR^.ResLines[i,j] + round( ResLines^[k] );
0803    if ResLines^[k] > zero then rpop[i,j] := true;
0804    GR^.BusLines[i,j] := GR^.BusLines[i,j] + round( BusLines^[k] );
0805    if BusLines ^[k] > zero then bpop[i,j] := true;
0806  end;
*
*
*
0817  begin
0818    ResResidualLines := ResResidualLines - GR^.ResLines[i,j];
0819    BusResidualLines := BusResidualLines - GR^.BusLines[i,j];
0820  end;

0558  d1      : double;
0559  d2      : double;
0560  dr1     : double;
0561  nr1     : integer;
R_Lines  : array[1..50,1..50] of single;
B_Lines  : array[1..50,1..50] of single;

0562
0563  begin
*
*
*
0791    GR^.ResLines[i,j] := 0;
0792    GR^.BusLines [i,j] := 0;
0793    bpop[i,j] := false;
0794    rpop[i,j] := false;
    R_Lines[i,j] := zero;
    B_Lines[i,j] := zero;
0795  end;
*
*
*
0800    j := round( abs(x^[k] - llx) / RasterSize + half );
0801
0802    R_Lines[i,j] := R_Lines[i,j] + ResLines^[k];
    if ResLines^[k] > zero then rpop[i,j] := true;
    B_Lines[i,j] := B_Lines[i,j] + BusLines^[k];
    if BusLines ^[k] > zero then bpop[i,j] := true;
0806  end;
*
*
*
0817  begin
    GR^.ResLines[i,j] := round(R_Lines[i,j]);
    GR^.BusLines[i,j] := round(B_Lines[i,j]);
0818  ResResidualLines := ResResidualLines - GR^.ResLines[i,j];
0819  BusResidualLines := BusResidualLines - GR^.BusLines[i,j];
0820  end;

```

6. Node Selection Criteria

PrimDist.pas

Original Code

```

400  for i := 1 to n do
401  begin
402    a^i := true;
403    b^i := 0;
404    c^i := dlarge;
405    d1^i := zero;
406  end;
*
*
*
421  begin
422    dist := dmtx^j^k;
423
424    cost := provisional_cost(k,num_terms,line_vector^k,GR,dist,(dist+d2s^j),density,
425      FillFactor);
426
427
428    if cost < c^k then
429    begin
430      c^k := cost;
431      d1^k := dist;
432      b^k := j;
433    end;
434
435    if min > c^k then
436    begin
437      min := c^k;
438      l := k;
439      dist2 := d1^k + d2s^b^k;
440    end;

```

Modified Code

```

400  for i := 1 to n do
401  begin
402    a^i := true;
403    b^i := 0;
404    c^i := dlarge;
405    d1^i := dlarge;
406  end;
*
*
*
421  begin
422    dist := dmtx^j^k;
423
424
428    if dist < d1^k then
429    begin
431      d1^k := dist;
432      b^k := j;
433    end;
434
435    if min > d1^k then
436    begin
437      min := d1^k;
438      l := k;
439      dist2 := d1^k + d2s^b^k;
440    end;

```

Cable.pas

Original Code

```

76  NumFullCables : integer;
77  LastCableLines : integer;

```

Modified Code

```

76  NumFullCables : double;
77  LastCableLines : double;

```

7. Overlapping Microgrids

ClusIntf.pas

Original Code

```
734 if( GR^BusinessUnits>0 ) then GR^.lines_per_bus := dBusinessLines/GR^BusinessUnits else
735     GR^.lines_per_bus := one;
736
737
738 llx := llx-half;
739 lly := lly-half;
740 urx := urx+half;
741 ury := ury+half;
742
743 RasterSize := GlobalRasterSize;
744
745 { if raster size is not given externally, or it is too large, calculate it here. }
746
747 RasterTooLarge := false;
748 if( max( (urx-llx), (ury-lly) )/RasterSize > fifty ) then RasterTooLarge := true;
749
750 if RasterTooLarge or (SetRaster = false) then
751 begin
752     RasterSize := max( (urx-llx), (ury-lly) )/fifty;
753 end;
754
755 GR^.MicroGridNS := RasterSize;
756 GR^.MicroGridEW := RasterSize;
```

Modified Code

```
734 if( GR^BusinessUnits>0 ) then GR^.lines_per_bus := dBusinessLines/GR^BusinessUnits else
735     GR^.lines_per_bus := one;
736
737
738 llx := llx-mil;
739 lly := lly-mil;
740 urx := urx+mil;
741 ury := ury+mil;
742
743 RasterSize := GlobalRasterSize;
744
745 { if raster size is not given externally, or it is too large, calculate it here. }
746
747 RasterTooLarge := false;
748 if( max( (urx-llx), (ury-lly) )/RasterSize > fifty ) then RasterTooLarge := true;
749
750 if RasterTooLarge or (SetRaster = false) then
751 begin
752     RasterSize := max( (urx-llx), (ury-lly) )/fifty;
753 end
    else
begin
    RasterSize := max( (urx-llx), (ury-lly) )/round(max( (urx-llx), (ury-lly) )/Rastersize+half);
end;
754
755 GR^.MicroGridNS := RasterSize;
756 GR^.MicroGridEW := RasterSize;
```

1. Drop Terminal Dispersion

PrimDist.pas

Original Code

```

467  procedure get_lines( GR      : GridRecordType_ptr;
468          density   : double;
469          row       : integer;
470          col       : integer;

471          NS_lots   : integer;
472          EW_lots   : integer;
*
*
*
530  line_vector^[n] := factor*lines_per_lot;
531
532  x^[n] := GR^LowerLeftX + (col-1)*GR^MicroGridEW + i*(one/EW_lots);
533  y^[n] := GR^LowerLeftY + (row-1)*GR^MicroGridNS + j*(one/NS_lots);
534
535  tmp := structure_cost_fn(line_vector^[n],0,density,GR^.hardness,GR^.DepthToBedrock,

```

Modified Code

```

467  procedure get_lines( GR      : GridRecordType_ptr;
468          density   : double;
469          row       : integer;
470          col       : integer;

471          NS_lots   : integer;
472          EW_lots   : integer;
*
*
*
530  line_vector^[n] := factor*lines_per_lot;
531
532  x^[n] := GR^LowerLeftX + (col-1)*GR^MicroGridEW + i*(GR^.MicroGridEW /EW_lots);
533  y^[n] := GR^LowerLeftY + (row-1)*GR^MicroGridNS + j*(GR^.MicroGridNS /NS_lots);
534
535  tmp := structure_cost_fn(line_vector^[n],0,density,GR^.hardness,GR^.DepthToBedrock,

```

2. Drop Terminal Orientation

PrimDist.pas

Original Code

```

467 procedure get_lines( GR      : GridRecordType_ptr;
468                      density   : double;
469                      row       : integer;
470                      col       : integer;
471                      NS_lots   : integer;
472                      EW_lots   : integer;
473                      *
474                      *
475                      *
530                      line_vector^n] := factor*lines_per_lot;
531
532                      x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + i*(one/EW_lots);
533                      y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + j*(one/NS_lots);

534                      tmp := structure_cost_fn(line_vector^n],0,density,GR^.hardness,GR^.DepthToBedrock,

```

Modified Code

```

467 procedure get_lines( GR      : GridRecordType_ptr;
468                      density   : double;
469                      row       : integer;
470                      col       : integer;
471                      divider_row : integer;
472                      divider_col : integer;
473                      NS_lots   : integer;
474                      EW_lots   : integer;
475                      *
476                      *
477                      *
530                      line_vector^n] := factor*lines_per_lot;
531
531                      if (row<=divider_row) and (col<=divider_col) then
531                      begin
531                          x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + i*(one/EW_lots);
531                          y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + j*(one/NS_lots);
531                      end;
531                      if (row>divider_row) and (col>divider_col) then
531                      begin
531                          x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + (EW_lots-i)*(one/EW_lots);
531                          y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + j*(one/NS_lots);
531                      end;
531                      if (row>divider_row) and (col<=divider_col) then
531                      begin
531                          x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + i*(one/EW_lots);
531                          y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + j*(one/NS_lots);
531                      end;
531                      if (row>divider_row) and (col>divider_col) then
531                      begin
531                          x^n] := GR^.LowerLeftX + (col-1)*GR^.MicroGridEW + (EW_lots-i)*(one/EW_lots);
531                          y^n] := GR^.LowerLeftY + (row-1)*GR^.MicroGridNS + (NS_lots-j)*(one/NS_lots);
531                      end;
534                      tmp := structure_cost_fn(line_vector^n],0,density,GR^.hardness,GR^.DepthToBedrock,

```

2. Drop Terminal Orientation *Continued*

PrimDist.pas

Attachment C
Page: 3 of 8

<u>Original Code</u>	<u>Modified Code</u>
<pre> * * * 573 procedure calculate_prim_distribution_cost(* * * 616 var i : integer; 617 j : integer; 618 n : integer; 619 num_terms : integer; 620 k : integer; 621 midx : double; 622 midy : double; * * * 695 n := 1; 696 697 for i := 1 to GR^.nrow do 698 for j := 1 to GR^.ncol do 699 if (flag^[i,j]=k) and (lines^[i,j]>zero) then 700 begin 701 lots := round(GR^.ResLines[i,j]/GR^.lines_per_house) + 702 round(GR^.BusLines[i,j]/GR^.lines_per_bus); 703 704 lot_divide(lots,NS_lots,EW_lots); 705 706 get_lines(GR, density, i, j, round(NS_lots), round(EW_lots), lines^[i,j], n, line_vector, 707 x, y, grid_droterm_cost, grid_nid_cost, grid_drop_cost, grid_drop_feet); 708 709 prim_drop_cost := prim_drop_cost + grid_drop_cost; </pre>	<pre> * * * 573 procedure calculate_prim_distribution_cost(* * * 616 var i : integer; 617 j : integer; 618 n : integer; 619 num_terms : integer; 620 k : integer; divider_row : integer; divider_col : integer; 621 midx : double; 622 midy : double; * * * 695 n := 1; 696 divider_row := round(abs(SAIY[n]-GR^.LowerLeftY)/GR^.MicroGridNS); divider_col := round(abs(SAIX[n]-GR^.LowerLeftX)/GR^.MicroGridEW); 697 for i := 1 to GR^.nrow do 698 for j := 1 to GR^.ncol do 699 if (flag^[i,j]=k) and (lines^[i,j]>zero) then 700 begin 701 lots := round(GR^.ResLines[i,j]/GR^.lines_per_house) + 702 round(GR^.BusLines[i,j]/GR^.lines_per_bus); 703 704 lot_divide(lots,NS_lots,EW_lots); 705 get_lines(GR, density, i, j, divider_row, divider_col, round(NS_lots), round(EW_lots), lines^[i,j], n, line_vector, x, y, grid_droterm_cost, grid_nid_cost, grid_drop_cost, grid_drop_feet); 708 709 prim_drop_cost := prim_drop_cost + grid_drop_cost; </pre>

3. Lot Size / Configuration

Lot_Div.pas

Original Code

```
018 procedure lot_divide(
*
*
*
054     NS_try_d := number_of_lots/EW_try ;
055     NS_try := round(NS_try_d);

056     waste := NS_try*EW_try - number_of_lots;
057     if (waste < 0) then waste := number_of_lots;
058     if (waste <= minwaste) then
059     begin
```

Modified Code

```
018 procedure lot_divide(
*
*
*
054     NS_try_d := number_of_lots/EW_try ;
055     NS_try := round(NS_try_d);
056     while (EW_try*NS_try < number_of_lots) do NS_try := NS_try + 1;
057     waste := NS_try*EW_try - number_of_lots;
058     if (waste < 0) then waste := number_of_lots;
059     if (waste <= minwaste) and (2*EW_try >= NS_try) and (2*NS_try >= EW_try) then
begin
```

4. Input Variables

Globals.pas

Original Code

```
950     readln(infile,
951         Sharing[i]^Density, Sharing[i]^bur_share,
952         Sharing[i]^ugd_share,Sharing[i]^aer_share);
```

Modified Code

```
950     readln(infile,
951         Sharing[i]^Density, Sharing[i]^ugd_share,
952         Sharing[i]^bur_share,Sharing[i]^aer_share);
```

Structur.pas

Original Code

```
267 then manhole_cost := ManholeCost[i]^HardCost/ManholeSpacing; { manhole
cost per foot for underground}
*
304 then manhole_cost := ManholeCost[i]^NormalCost/ManholeSpacing; { manhole
cost per foot for underground}
*
340 then manhole_cost := ManholeCost[i]^SoftCost/ManholeSpacing; { manhole
cost per foot for underground}
```

Modified Code

```
267 then manhole_cost := ManholeCost[i+1]^HardCost/ManholeSpacing; { manhole cost per foot
for underground}
*
304 then manhole_cost := ManholeCost[i+1]^NormalCost/ManholeSpacing; { manhole cost per
foot for underground}
*
340 then manhole_cost := ManholeCost[i+1]^SoftCost/ManholeSpacing; { manhole cost per foot
for underground}
```

Tech.pas

Original Code

```
146 then tmp3 := IntfcCost[n]^cost;
```

Modified Code

```
146 then tmp3 := IntfcCost[n+1]^cost;
```

Terminal.pas

Original Code

```
258 begin
259     temp := pct_ugd*DropTermCost[i]^CostUgd +
260             pct_bur*DropTermCost[i]^CostBur +
261             pct_aer*DropTermCost[i]^CostAer;
262 end;
```

Modified Code

```
258 begin
259     temp := pct_ugd*DropTermCost[i+1]^CostUgd +
260             pct_bur*DropTermCost[i+1]^CostBur +
261             pct_aer*DropTermCost[i+1]^CostAer;
262 end;
```

5. Residual Line Allocation

ClusIntf.pas

```

0558  d1      : double;
0559  d2      : double;
0560  dr1     : double;
0561  nr1     : integer;

0562
0563 begin
*
*
*
0791  GR^.ResLines[i,j] := 0;
0792  GR^.BusLines [i,j] := 0;
0793  bpop[i,j] := false;
0794  rpop[i,j] := false;

0795 end;
*
*
*
0800  j := round( abs(x^[k] - llx)/RasterSize + half );
0801
0802  GR^.ResLines[i,j] := GR^.ResLines[i,j] + round(ResLines^[k]);
0803  if ResLines^[k] > zero then rpop[i,j] := true;
0804  GR^.BusLines [i,j] := GR^.BusLines [i,j] + round(BusLines^[k]);
0805  if BusLines ^[k] > zero then bpop[i,j] := true;
0806 end;
*
*
*
0817 begin

0818  ResResidualLines := ResResidualLines - GR^.ResLines[i,j];
0819  BusResidualLines := BusResidualLines - GR^.BusLines [i,j];
0820 end;

0558  d1      : double;
0559  d2      : double;
0560  dr1     : double;
0561  nr1     : integer;
R_Lines  : array[1..50,1..50] of single;
B_Lines  : array[1..50,1..50] of single;

0562
0563 begin
*
*
*
0791  GR^.ResLines[i,j] := 0;
0792  GR^.BusLines [i,j] := 0;
0793  bpop[i,j] := false;
0794  rpop[i,j] := false;
R_Lines[i,j] := zero;
B_Lines[i,j] := zero;

0795 end;
*
*
*
0800  j := round( abs(x^[k] - llx)/RasterSize + half );
0801
0802  R_Lines[i,j] := R_Lines[i,j] + ResLines^[k];
if ResLines^[k] > zero then rpop[i,j] := true;
B_Lines[i,j] := B_Lines[i,j] + BusLines^[k];
if BusLines ^[k] > zero then bpop[i,j] := true;
0806 end;
*
*
*
0817 begin
GR^.ResLines[i,j] := round(R_Lines[i,j]);
GR^.BusLines [i,j] := round(B_Lines[i,j]);
0818  ResResidualLines := ResResidualLines - GR^.ResLines[i,j];
0819  BusResidualLines := BusResidualLines - GR^.BusLines [i,j];
0820 end;

```

6. Node Selection Criteria

PrimDist.pas

Original Code

```

400  for i := 1 to n do
401  begin
402    a^ [i] := true;
403    b^ [i] := 0;
404    c^ [i] := dlarge;
405    d1^ [i] := zero;
406  end;
*
*
*
421  begin
422    dist := dmrx^ [j]^ [k];
423
424    cost := provisional_cost(k,num_terms,line_vector^ [k],GR,dist,(dist+d2s^ [j]),density,
425      FillFactor);
426
427
428    if cost < c^ [k] then
429    begin
430      c^ [k] := cost;
431      d1^ [k] := dist;
432      b^ [k] := j;
433    end;
434
435    if min > c^ [k] then
436    begin
437      min := c^ [k];
438      l := k;
439      dist2 := d1^ [k] + d2s^ [ b^ [k] ];
440    end;

```

Modified Code

```

400  for i := 1 to n do
401  begin
402    a^ [i] := true;
403    b^ [i] := 0;
404    c^ [i] := dlarge;
405    d1^ [i] := dlarge;
406  end;
*
*
*
421  begin
422    dist := dmrx^ [j]^ [k];
423
424
428    if dist < d1^ [k] then
429    begin
431      d1^ [k] := dist;
432      b^ [k] := j;
433    end;
434
435    if min > d1^ [k] then
436    begin
437      min := d1^ [k];
438      l := k;
439      dist2 := d1^ [k] + d2s^ [ b^ [k] ];
440    end;

```

Cable.pas

Original Code

```

76  NumFullCables : integer;
77  LastCableLines : integer;

```

Modified Code

```

76  NumFullCables : double;
77  LastCableLines : double;

```

7. Overlapping Microgrids

ClusIntf.pas

Original Code

```

734 if ( GR^BusinessUnits>0 ) then GR^.lines_per_bus := dBusinessLines/GR^BusinessUnits else
735     GR^.lines_per_bus := one;
736
737
738 llx := llx-half;
739 lly := lly-half;
740 urx := urx+half;
741 ury := ury+half;
742
743 RasterSize := GlobalRasterSize;
744
745 { if raster size is not given externally, or it is too large, calculate it here. }
746
747 RasterTooLarge := false;
748 if ( max( (urx-llx), (ury-lly) )/RasterSize > fifty ) then RasterTooLarge := true;
749
750 if RasterTooLarge or (SetRaster = false) then
751 begin
752     RasterSize := max( (urx-llx), (ury-lly) )/fifty;
753 end;
754
755 GR^.MicroGridNS := RasterSize;
756 GR^.MicroGridEW := RasterSize;

```

Modified Code

```

734 if ( GR^BusinessUnits>0 ) then GR^.lines_per_bus := dBusinessLines/GR^BusinessUnits else
735     GR^.lines_per_bus := one;
736
737
738 llx := llx-mil;
739 lly := lly-mil;
740 urx := urx+mil;
741 ury := ury+mil;
742
743 RasterSize := GlobalRasterSize;
744
745 { if raster size is not given externally, or it is too large, calculate it here. }
746
747 RasterTooLarge := false;
748 if ( max( (urx-llx), (ury-lly) )/RasterSize > fifty ) then RasterTooLarge := true;
749
750 if RasterTooLarge or (SetRaster = false) then
751 begin
752     RasterSize := max( (urx-llx), (ury-lly) )/fifty;
753 end
754 else
755 begin
756     RasterSize := max( (urx-llx), (ury-lly) )/round(max( (urx-llx), (ury-lly) )/Rastersize+half);
757 end;
758
759 GR^.MicroGridNS := RasterSize;
760 GR^.MicroGridEW := RasterSize;

```

D

Virginia Demand Data Extrapolated to 2002

Year	FCC ARMIS DATA: Access Lines					NECA Data: DEMs			FCC ARMIS DATA: Call Completion			
	SL_Bus	Business	Public	Residential	Special	Local	Intra	Inter	Local	IntraLATA	IntraState	InterState
ARMIS Data												
1994	59,911	1,031,538	31,469	1,842,426	175,683	46,067,107	4,136,331	10,275,124	9,464,315	151,805	322,132	966,356
1995	67,677	1,111,688	30,806	1,900,462	205,774	48,523,000	4,138,000	11,081,000	10,629,596	115,699	349,267	1,096,326
1996	46,697	1,195,524	30,570	1,969,369	294,079	54,484,014	4,172,605	12,133,612	11,709,460	103,482	371,631	1,367,827
1997	48,387	1,295,289	41,332	2,072,141	379,504	61,232,773	4,134,910	12,698,311	11,636,920	93,092	438,691	1,772,189
1998	39,466	1,382,351	41,505	2,176,481	548,952	66,187,347	4,416,935	13,506,309	11,560,725	92,203	479,866	1,896,239
1999	37,513	1,456,787	41,372	2,271,656	793,787	75,814,464	5,061,536	14,267,000	11,728,385	99,468	507,639	1,988,658
2000	38,948	1,492,801	38,521	2,268,827	1,402,596	80,210,945	5,355,055	14,739,000	11,068,651	108,894	905,997	1,664,726
Growth Rate	-6.93%	6.35%	3.43%	3.53%	41.37%	9.68%	4.40%	6.20%	2.64%	-5.39%	18.81%	9.49%
2001	36,251	1,587,650	39,841	2,348,929	1,982,895	87,978,000	5,590,560	15,652,421	11,361,324	103,028	1,076,405	1,822,680
2002	33,740	1,688,525	41,207	2,431,860	2,803,283	96,497,161	5,836,423	16,622,449	11,661,736	97,479	1,278,864	1,995,621
Annual Growth Rates												
1994												
1995	12.96%	7.77%	-2.11%	3.15%	17.13%	5.33%	0.04%	7.84%	12.31%	-23.78%	8.42%	13.45%
1996	-31.00%	7.54%	-0.77%	3.63%	42.91%	12.28%	0.84%	9.50%	10.16%	-10.56%	6.40%	24.76%
1997	3.62%	8.34%	35.20%	5.22%	29.05%	12.39%	-0.90%	4.65%	-0.62%	-10.04%	18.04%	29.56%
1998	-18.44%	6.72%	0.42%	5.04%	44.65%	8.09%	6.82%	6.36%	-0.65%	-0.95%	9.39%	7.00%
1999	-4.95%	5.38%	-0.32%	4.37%	44.60%	14.55%	14.59%	5.63%	1.45%	7.88%	5.79%	4.87%
2000	3.83%	2.47%	-6.89%	-0.12%	76.70%	5.80%	5.80%	3.31%	-5.63%	9.48%	78.47%	-16.29%
2001	-6.93%	6.35%	3.43%	3.53%	41.37%	9.68%	4.40%	6.20%	2.64%	-5.39%	18.81%	9.49%
2002	-6.93%	6.35%	3.43%	3.53%	41.37%	9.68%	4.40%	6.20%	2.64%	-5.39%	18.81%	9.49%
Avg.	-5.98%	6.37%	4.05%	3.54%	42.22%	9.73%	4.50%	6.21%	2.79%	-4.84%	20.52%	10.29%
Compounded Annual Growth Rate												
1994 - 2002	-6.93%	6.35%	3.43%	3.53%	41.37%	9.68%	4.40%	6.20%	2.64%	-5.39%	18.81%	9.49%

E



Common Support Services Expense for Verizon - Virginia
(Actual & Forecasted)

Year	6510 PP&E Expenses	6530 Network Ops Expenses	6610 Marketing Expenses	6620 Services Expenses	6700 E&P and G&A	Total
1994	2,549	114,487	49,989	170,264	148,649	485,938
1995	1,617	115,934	60,593	163,106	171,740	512,990
1996	486	129,065	60,337	179,283	198,129	567,300
1997	2,099	114,900	65,817	154,094	176,235	513,145
1998	1,176	104,866	62,065	140,479	167,717	476,303
1999	734	97,891	67,510	135,691	138,181	440,007
2000	381	110,392	97,801	135,883	148,083	492,540
Growth rate	-27.15%	-0.61%	11.84%	-3.69%	-0.06%	0.23%
2001	278	109,724	109,376	130,870	147,989	493,649
2002	202	109,060	122,321	126,041	147,895	494,761

Percentage Change in Common Support Services Expense for Verizon - Virginia

Year	6510 PP&E Expenses	6530 Network Ops Expenses	6610 Marketing Expenses	6620 Services Expenses	6700 E&P and G&A	Total
1995	-36.56%	1.26%	21.21%	-4.20%	15.53%	5.57%
1996	-69.94%	11.33%	-0.42%	9.92%	15.37%	10.59%
1997	331.89%	-10.98%	9.08%	-14.05%	-11.05%	-9.55%
1998	-43.97%	-8.73%	-5.70%	-8.84%	-4.83%	-7.18%
1999	-37.59%	-6.65%	8.77%	-3.41%	-17.61%	-7.62%
2000	-48.09%	12.77%	44.87%	0.14%	7.17%	11.94%
2001	-27.15%	-0.61%	11.84%	-3.69%	-0.06%	0.23%
2002	-27.15%	-0.61%	11.84%	-3.69%	-0.06%	0.23%

FCC's Common Support Services Expenses

FCC Regression with Actual Verizon-VA 1998 Data

Number of Lines

Account	Switched	Special	Toll	Total
All 80 Company Lines	164,940,975	35,588,846	910,990,713	
All 80 Company Independent Variable	0.8225	0.1775	4,5429	
Verizon-Virginia Lines	3,600,337	548,952	17,923,244	
Verizon-Virginia Independent Variable	0.8677	0.1323	4,3196	

FCC Regression with Estimated 2002 ARMIS Data

Account	Switched	Special	Toll	Total
All 80 Company Lines	170,057,552	69,603,686	931,039,845	
All 80 Company Independent Variable	0.7096	0.2904	3,8848	
Verizon-Virginia Lines	4,169,686	2,803,283	22,458,872	
Verizon-Virginia Independent Variable	0.5980	0.4020	3,2208	

Per-Line Results

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (0.0006)	\$ (0.0017)	\$ 0.0002	\$ 0.0002
6530 Network Operations	\$ 0.0182	\$ 0.0130	\$ 0.0026	\$ 0.0292
6610 Marketing	\$ 0.0188	\$ 0.0195	\$ (0.0000)	\$ 0.0188
6620 Service Expense/Customer Operations	\$ 0.0435	\$ 0.0030	\$ 0.0007	\$ 0.0395
6700 Executive, Planning, General & Administrative	\$ 0.0326	\$ 0.0064	\$ 0.0052	\$ 0.0614
Total	\$ 0.1125	\$ 0.0402	\$ 0.0087	\$ 0.1391

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ (0.0006)	\$ (0.0017)	\$ 0.0002	\$ (0.0001)
All 80 Company Independent Variable	\$ 0.0182	\$ 0.0130	\$ 0.0026	\$ 0.0269
Verizon-Virginia Lines	\$ 0.0188	\$ 0.0195	\$ (0.0000)	\$ 0.0189
Verizon-Virginia Independent Variable	\$ 0.0435	\$ 0.0030	\$ 0.0007	\$ 0.0345
Total	\$ 0.1125	\$ 0.0402	\$ 0.0087	\$ 0.1252

Adjustments

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	0.00%	0.00%	0.00%	0.00%
6530 Network Operations	-2.80%	-2.60%	-2.60%	-2.60%
6610 Marketing	-94.06%	-94.06%	-94.06%	-94.06%
6620 Service Expense/Customer Operations	0.00%	0.00%	0.00%	0.00%
6700 Executive, Planning, General & Administrative	-20.00%	-20.00%	-20.00%	-20.00%
Average	-21.91%	-49.69%	-12.43%	-20.64%

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ (0.0006)	\$ (0.0017)	\$ 0.0002	\$ (0.0001)
All 80 Company Independent Variable	\$ 0.0177	\$ 0.0126	\$ 0.0026	\$ 0.0262
Verizon-Virginia Lines	\$ 0.0011	\$ 0.0012	\$ (0.0000)	\$ 0.0011
Verizon-Virginia Independent Variable	\$ 0.0435	\$ 0.0030	\$ 0.0007	\$ 0.0345
Total	\$ 0.0879	\$ 0.0202	\$ 0.0076	\$ 0.0977

Adjusted Results

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (0.0006)	\$ (0.0017)	\$ 0.0002	\$ (0.0001)
6530 Network Operations	\$ 0.0177	\$ 0.0126	\$ 0.0026	\$ 0.0262
6610 Marketing	\$ 0.0011	\$ 0.0012	\$ (0.0000)	\$ 0.0011
6620 Service Expense/Customer Operations	\$ 0.0435	\$ 0.0030	\$ 0.0007	\$ 0.0345
6700 Executive, Planning, General & Administrative	\$ 0.0261	\$ 0.0051	\$ 0.0041	\$ 0.0411
Total	\$ 0.0879	\$ 0.0202	\$ 0.0076	\$ 0.0977

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ (0.0006)	\$ (0.0017)	\$ 0.0002	\$ (0.0001)
All 80 Company Independent Variable	\$ 0.0177	\$ 0.0126	\$ 0.0026	\$ 0.0262
Verizon-Virginia Lines	\$ 0.0011	\$ 0.0012	\$ (0.0000)	\$ 0.0011
Verizon-Virginia Independent Variable	\$ 0.0435	\$ 0.0030	\$ 0.0007	\$ 0.0345
Total	\$ 0.0879	\$ 0.0202	\$ 0.0076	\$ 0.0977

Monthly Results

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (0.05)	\$ (0.14)	\$ 0.02	\$ 0.01
6530 Network Operations	\$ 1.48	\$ 1.05	\$ 0.21	\$ 2.37
6610 Marketing	\$ 0.09	\$ 0.10	\$ (0.00)	\$ 0.09
6620 Service Expense/Customer Operations	\$ 3.62	\$ 0.25	\$ 0.06	\$ 3.92
6700 Executive, Planning, General & Administrative	\$ 2.18	\$ 0.43	\$ 0.34	\$ 3.43
Total	\$ 7.32	\$ 1.68	\$ 0.63	\$ 9.20

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ (0.05)	\$ (0.14)	\$ 0.02	\$ (0.01)
All 80 Company Independent Variable	\$ 1.48	\$ 1.05	\$ 0.21	\$ 2.18
Verizon-Virginia Lines	\$ 0.09	\$ 0.10	\$ (0.00)	\$ 0.09
Verizon-Virginia Independent Variable	\$ 3.62	\$ 0.25	\$ 0.06	\$ 3.87
Total	\$ 7.32	\$ 1.68	\$ 0.63	\$ 8.14

Estimated Expenses for All 80 Companies (In \$1,000)

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (94,452)	\$ (61,465)	\$ 191,210	\$ 35,293
6530 Network Operations	\$ 2,924,728	\$ 450,097	\$ 2,326,815	\$ 5,701,641
6610 Marketing	\$ 183,657	\$ 41,196	\$ (1,195)	\$ 223,657
6620 Service Expense/Customer Operations	\$ 7,168,730	\$ 106,407	\$ 648,811	\$ 7,923,949
6700 Executive, Planning, General & Administrative	\$ 4,307,860	\$ 183,156	\$ 3,755,025	\$ 8,245,841
Total	\$ 14,490,324	\$ 719,392	\$ 6,920,668	\$ 22,130,381

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ (97,382)	\$ (120,211)	\$ 195,418	\$ (22,175)
All 80 Company Independent Variable	\$ 3,015,455	\$ 880,288	\$ 2,378,024	\$ 6,273,767
Verizon-Virginia Lines	\$ 189,354	\$ 80,570	\$ (1,222)	\$ 268,702
Verizon-Virginia Independent Variable	\$ 7,391,109	\$ 208,108	\$ 663,090	\$ 8,262,307
Total	\$ 4,441,287	\$ 358,211	\$ 3,837,666	\$ 8,637,164

Estimated Expenses for Verizon-VA (In \$1,000)

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (2,062)	\$ (948)	\$ 3,762	\$ 752
6530 Network Operations	\$ 63,841	\$ 6,943	\$ 45,779	\$ 116,563
6610 Marketing	\$ 4,009	\$ 635	\$ (24)	\$ 4,621
6620 Service Expense/Customer Operations	\$ 166,479	\$ 1,641	\$ 12,765	\$ 170,886
6700 Executive, Planning, General & Administrative	\$ 94,028	\$ 2,825	\$ 73,878	\$ 170,731
Total	\$ 316,295	\$ 11,096	\$ 136,160	\$ 463,552

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ (2,388)	\$ (4,841)	\$ 4,714	\$ (2,515)
All 80 Company Independent Variable	\$ 73,937	\$ 35,454	\$ 57,384	\$ 166,754
Verizon-Virginia Lines	\$ 4,643	\$ 3,245	\$ (29)	\$ 7,856
Verizon-Virginia Independent Variable	\$ 181,225	\$ 8,382	\$ 15,995	\$ 205,601
Total	\$ 108,897	\$ 14,427	\$ 92,574	\$ 215,898

1998 Actual Verizon-Virginia Specific Data

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (3,147)	\$ (2,048)	\$ 6,371	\$ 1,176
6530 Network Operations	\$ 52,394	\$ 8,063	\$ 41,683	\$ 102,139
6610 Marketing	\$ 3,026	\$ 679	\$ (20)	\$ 3,685
6620 Service Expense/Customer Operations	\$ 127,090	\$ 1,886	\$ 11,502	\$ 140,479
6700 Executive, Planning, General & Administrative	\$ 70,093	\$ 2,880	\$ 61,101	\$ 134,174
Total	\$ 249,466	\$ 11,560	\$ 120,637	\$ 381,653

Account	Switched	Special	Toll	Total
All 80 Company Lines	\$ 888	\$ 1,096	\$ (1,782)	\$ 202
All 80 Company Independent Variable	\$ 51,056	\$ 14,905	\$ 40,263	\$ 106,224
Verizon-Virginia Lines	\$ 5,118	\$ 2,178	\$ (33)	\$ 7,263
Verizon-Virginia Independent Variable	\$ 112,751	\$ 3,175	\$ 10,115	\$ 126,041
Total	\$ 60,839	\$ 4,907	\$ 52,570	\$ 118,316

Monthly Results Adjusted for Verizon-Virginia

Account	Switched	Special	Toll	Total
6510 Other Property, Plant & Equipment	\$ (0.07)	\$ (0.31)	\$ 0.03	\$ 0.02
6530 Network Operations	\$ 1.21	\$ 1.22	\$ 0.19	\$ 2.05
6610 Marketing	\$ 0.07	\$ 0.10	\$ (0.00)	\$ 0.07
6620 Service Expense				

F



A1 STAFF FGA. 860 272 0610 F1831 REC'D

Overhead Analysis Based on Subject to Separations Accounting as Reported by ARMIS

Overhead Analysis Based on Subject to Separations Accounting as Reported by ARMS

Company Name	Executive, Planning and General & Administrative						Total Operating Revenues						Ratio: Expenses / (Revenues - Expenses)								
	1994	1995	1996	1997	1998	1999	2000	1994	1995	1996	1997	1998	1999	2000	1994	1995	1996	1997	1998	1999	2000
Verizon - Contel SO-Michigan	1,991	1,998	1,979	2,328	3,230	1,742	2,817	26,268	26,374	28,593	28,214	27,290	27,761	27,848	8.55%	8.19%	7.44%	8.99%	13.42%	6.70%	11.25%
Verizon - Florida	136,757	154,059	128,728	114,468	142,382	54,782	91,050	1,197,073	1,270,577	1,335,955	1,419,422	1,447,077	1,476,713	1,460,838	12.90%	13.80%	10.66%	8.77%	10.91%	3.85%	6.65%
Verizon - New England - Maine	91,866	71,250	72,215	78,432	59,947	41,408	42,347	443,482	438,620	469,011	457,300	517,835	514,849	492,140	26.08%	19.39%	18.20%	20.70%	12.86%	8.75%	9.41%
Verizon - New England - Massachusetts	428,536	378,549	346,854	418,671	393,604	208,316	240,418	2,602,026	2,679,034	2,871,502	2,798,863	2,874,908	2,738,449	2,801,264	19.72%	16.35%	13.74%	17.59%	15.86%	8.23%	9.30%
Verizon - New England - New Hampshire	79,937	73,480	70,342	71,997	68,344	38,745	39,086	463,222	482,891	520,007	521,874	526,448	502,737	501,434	20.88%	17.95%	15.64%	16.01%	14.92%	8.35%	8.45%
Verizon - New England - Rhode Island	61,973	53,574	46,014	47,373	60,251	26,866	29,040	344,034	354,506	382,458	385,871	392,939	374,479	361,780	21.97%	17.80%	13.68%	14.00%	18.11%	7.42%	8.73%
Verizon - New England - Vermont	46,743	37,782	38,200	37,904	30,266	19,471	20,112	231,033	279,791	245,568	250,543	249,182	245,856	-	25.36%	22.22%	18.47%	18.11%	13.20%	8.48%	8.92%
Verizon - New York Telephone	1,382,784	1,150,673	872,927	801,094	1,011,689	1,059,104	749,034	7,651,317	7,692,531	7,728,491	7,572,369	7,821,008	7,945,887	7,845,727	-	-	-	-	-	-	-
Verizon Hawaii	63,254	72,384	60,385	58,178	64,836	23,806	16,902	449,560	462,593	475,573	489,075	506,577	503,091	463,751	16.37%	18.54%	14.54%	13.50%	14.68%	4.09%	3.78%
Verizon MD-Contel-Missouri	22,010	25,077	19,440	20,466	22,169	9,412	(718)	198,905	199,591	204,286	190,503	207,104	213,869	207,993	12.44%	14.37%	10.52%	12.04%	11.99%	4.60%	-0.34%
Verizon MO-Missouri	9,030	10,687	7,850	7,331	9,080	11,020	4,483	67,928	79,220	79,849	86,758	85,638	93,195	83,834	15.33%	15.58%	10.90%	9.23%	13.19%	13.41%	5.65%
Verizon NO-Contel/Illinois	13,756	16,059	13,542	10,073	10,557	3,314	1,413	116,984	110,958	112,294	116,024	121,385	118,995	118,134	13.33%	16.92%	13.71%	10.45%	8.53%	2.86%	1.21%
Verizon NO-Contel/Indiana	9,624	11,869	9,160	7,141	9,811	1,862	1,492	104,932	102,424	103,010	108,805	119,389	127,735	126,786	10.10%	13.11%	9.76%	7.04%	8.95%	1.48%	1.19%
Verizon NO-Contel/Pennsylvania	4,038	5,143	6,766	3,414	5,214	822	2,814	36,929	35,599	37,231	40,863	47,519	42,195	43,185	12.28%	16.89%	22.21%	9.17%	12.32%	1.99%	6.97%
Verizon NO-Contel/Quaker State	2,424	2,621	396	2,881	3,304	925	1,676	25,215	25,595	23,381	24,647	32,077	30,198	28,556	10.64%	11.41%	1.72%	13.24%	11.48%	3.16%	6.24%
Verizon NO-General Offices	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Verizon NO-Illinois	42,224	49,450	50,062	24,984	44,125	19,832	3,558	371,476	391,398	403,023	421,862	430,991	422,935	431,385	12.82%	14.46%	14.18%	6.30%	11.41%	4.92%	0.83%
Verizon NO-Indiana	57,140	68,035	50,793	47,810	34,351	25,274	9,098	466,421	477,343	499,686	528,579	548,537	559,973	519,613	13.96%	16.62%	11.32%	9.94%	6.68%	4.74%	1.78%
Verizon NO-Michigan	44,430	48,700	45,880	23,826	48,286	12,149	8,079	410,459	424,224	436,488	445,134	435,626	423,087	-	12.14%	12.97%	11.75%	5.53%	11.60%	2.87%	1.95%
Verizon NO-Ohio	51,384	56,615	49,546	35,107	53,642	23,069	13,822	526,881	535,362	542,089	541,570	541,929	519,126	514,677	10.81%	11.87%	10.06%	6.93%	11.00%	4.65%	2.76%
Verizon NO-Pennsylvania	33,152	38,431	34,952	15,103	34,192	11,729	6,347	275,246	276,074	292,597	290,205	290,205	293,262	288,919	13.89%	16.17%	13.57%	5.20%	12.90%	3.68%	1.97%
Verizon NO-Wisconsin	28,816	36,620	29,813	16,758	29,201	9,044	3,018	283,103	281,703	289,867	295,069	293,262	313,471	281,867	11.33%	14.94%	11.47%	6.02%	11.06%	2.97%	1.08%
Verizon NW-Contel/Washington	5,683	3,978	4,861	4,959	4,936	1,810	636	58,560	63,199	59,930	62,363	63,942	67,061	68,776	10.75%	6.72%	8.83%	8.64%	8.37%	2.77%	0.93%
Verizon NW-Idaho	10,026	9,394	6,544	7,676	8,985	2,872	2,182	87,992	92,899	98,740	107,231	108,209	112,526	110,160	12.86%	11.25%	9.47%	7.71%	9.08%	2.62%	2.02%
Verizon NW-Oregon	30,808	34,494	26,388	26,469	29,451	11,555	11,771	233,974	274,282	286,168	316,474	321,197	320,100	319,959	15.16%	14.39%	10.16%	9.13%	10.09%	3.74%	3.82%
Verizon NW-Washington	54,583	57,247	46,977	53,548	54,114	26,567	22,903	426,406	467,329	501,345	522,104	546,586	596,295	583,456	14.68%	13.31%	10.34%	11.43%	10.99%	4.66%	4.09%
Verizon NW-West Coast California	1,759	2,567	1,876	855	1,217	446	483	11,098	9,897	13,103	12,371	13,654	13,053	10,904	18.86%	35.02%	16.73%	7.42%	9.79%	3.54%	4.63%
Verizon SO-Alabama	12,063	16,182	9,944	12,907	14,277	6,351	7,177	102,085	108,678	118,740	128,916	124,743	128,737	131,551	13.40%	17.49%	9.14%	11.13%	12.92%	5.28%	5.77%
Verizon SO-Contel-Kentucky	5,066	7,144	6,228	5,574	6,851	2,501	2,971	56,264	61,877	66,942	68,927	72,051	73,963	-	9.86%	13.05%	10.26%	8,80%	11.03%	3.60%	4.18%
Verizon SO-Contel-North Carolina	7,554	7,389	7,263	8,468	9,150	3,023	7,743	78,370	74,586	80,067	81,504	85,123	89,079	89,150	10.67%	11.00%	9.98%	11.50%	12.04%	3.51%	9.51%
Verizon SO-Contel-South Carolina	1,402	1,296	1,610	1,354	1,950	552	638	12,606	13,302	14,027	14,572	16,858	16,372	19,893	12.51%	10.79%	12.97%	10.24%	13.08%	3.10%	3.31%
Verizon SO-Contel-Virginia	35,560	41,034	34,011	35,625	37,645	17,736	19,474	314,692	333,401	360,887	378,874	401,348	342,222	388,380	12.74%	14.04%	10.41%	10.38%	10.35%	5.47%	5.28%
Verizon SO-Kentucky	2,558	4,106	2,576	1,610	2,706	419	1,414	22,462	21,069	23,193	23,894	25,437	24,348	23,645	12.85%	22.99%	12.49%	7.22%	11.90%	1.75%	6.38%
Verizon SO-North Carolina	31,237	39,260	25,383	20,900	30,460	17,508	14,484	284,628	303,925	325,192	330,325	350,098	367,716	354,340	12.33%	14.84%	8.47%	6.75%	9.53%	5.00%	4.26%
Verizon SO-South Carolina	17,154	23,502	17,743	13,551	13,450	15,588	9,381	144,100	141,493	164,143	180,112	188,990	200,626	198,180	13.51%	19.92%	12.12%	8,14%	7.66%	8.42%	4.97%
Verizon SO-Virginia	13,077	15,239	12,226	11,596	14,610	7,398	6,886	228,886	237,003	241,101	254,410	273,443	235,534	234,900	12.35%	12.26%	10.23%	9,56%	11.33%	3.53%	5.00%
Verizon SW-Arkansas	2,360	3,115	3,880	4,041	4,560	2,776	3,136	58,654	65,521	64,590	72,747	75,453	72,331	-	11.50%	15.13%	19.19%	18.91%	19.94%	13.37%	15.41%
Verizon SW-Contel-New Mexico	7,102	9,063	6,326	6,427	7,453	2,849	-	39,915	35,245	39,536	38,872	36,988	-	-	13.78%	16.05%	10.86%	8,69%	10.66%	4.10%	-
Verizon SW-Contel-Texas	16,066	19,188	16,592	14,603	18,043	6,796	(951)	164,831	154,611	156,860	139,747	138,211	134,540	105,233	10.80%	14.17%	11.63%	11.67%	15.01%	5.32%	-0.90%
Verizon SW-New Mexico	3,988	3,388	2,725	2,994	2,990	1,854	-	27,753	26,238	29,496	30,270	33,042	32,522	-	16.78%	15.51%	18%	10.98%	9.95%	5.36%	-
Verizon SW-Oklahoma	8,670	8,002	6,894	7,703	6,968	3,138	-	72,808	65,646	68,708	69,047	75,405	72,986	-	13.52%	14.06%	11.53%	12.56%	10.22%	4.49%	-
Verizon SW-Texas	120,420	137,835	120,250	108,336	138,505	95,014	66,533	978,009	1,028,783	1,112,779	1,176,314	1,238,260	1,234,807	1,226,886	14.04%	15.47%	12.12%	10.14%	12.59%	8.34%	5.73%
Verizon Contel of Eastern Missouri	930	788	717	490	389	173	2	4,410	4,507	3,158	1,912	3,553	3,431	3,260	26.72%	21.19%	23.37%	34.46%	12.29%	5.31%	0.06%
Verizon Contel Systems of Missouri	3,315	4,111	2,915	3,092	3,153	1,526	(680)	39,433	38,349	39,133	38,768	37,802	37,089	29,154	9.48%	12.01%	8,05%	8,67%	9,10%	4.20%	-1.88%
Verizon Delaware	26,749	27,398	26,454	26,849	25,506	21,712															

Overhead Analysis Based on Account Totals as Reported by ARMS

Executive, Planning and General & Administrative										Total Operating Revenues						Ratio							
1994	1995	1996	1997	1998	1999	2000	1994	1995	1996	1997	1998	1999	2000	1994	1995	1996	1997	1998	1999	2000			
Alliant Telecommun. Co.	16,696	17,761	24,062	33,718	21,159	23,985	24,928	175,915	184,380	194,956	208,066	216,352	208,049	207,578	10.49%	10.67%	14.08%	19.34%	10.84%	13.03%	13.65%		
Aitel Carolina Incorporated	-	-	-	-	11,839	12,991	12,200	-	-	-	-	124,618	130,711	142,355	-	-	-	-	10.50%	11.04%	9.37%		
Aitel George Communications Corp.	-	-	16,221	16,954	18,558	21,445	22,801	27,281	-	210,360	218,786	232,933	246,703	253,350	267,583	-	-	-	-	-	-	-	
Aitel of Pennsylvania	-	-	15,322	12,875	15,970	17,160	17,554	12,732	-	133,145	139,772	146,533	152,033	158,561	164,899	-	-	-	-	-	-	-	
BellSouth-Alabama	17,005	51,451	46,975	33,441	25,324	15,203	9,160	1,150,465	1,178,729	1,215,410	1,209,954	1,292,822	1,365,660	1,436,529	1.50%	4.56%	4.02%	2.84%	2.00%	1.13%	0.64%		
BellSouth-Florida	367,803	452,080	462,539	390,620	321,999	323,976	322,340	3,463,985	3,420,157	3,508,157	3,529,238	3,736,433	4,211,854	4,432,052	11.92%	15.19%	15.19%	12.45%	9.43%	8.33%	7.84%		
BellSouth-Georgia	177,440	229,216	262,804	253,912	168,696	161,305	178,656	2,268,045	2,358,784	2,562,093	2,705,925	2,964,777	3,222,215	3,310,548	8.41%	10.76%	11.43%	10.36%	5.68%	5.27%	5.70%		
BellSouth-Kentucky	77,680	96,694	93,462	82,088	71,126	68,387	65,115	722,265	745,286	760,467	757,629	804,501	831,756	851,076	12.05%	14.91%	14.01%	12.30%	9.70%	8.98%	8.28%		
BellSouth-Louisiana	149,250	183,560	174,465	155,375	135,609	127,306	129,541	1,343,263	1,390,717	1,414,132	1,422,741	1,516,733	1,633,862	1,709,196	12.50%	15.20%	14.07%	12.26%	9.82%	8.45%	8.20%		
BellSouth-Mississippi	70,816	86,338	81,834	54,612	41,440	44,137	52,037	855,744	896,971	917,479	909,598	973,943	1,024,727	1,109,437	8.98%	10.68%	9.79%	6.39%	4.44%	4.50%	4.92%		
BellSouth-North Carolina	96,186	125,068	140,722	127,861	101,157	93,060	88,607	1,373,620	1,417,775	1,490,693	1,544,580	1,685,893	1,769,485	1,811,846	7.53%	9.74%	10.42%	9.03%	6.38%	5.55%	5.14%		
BellSouth-South Carolina	92,171	113,590	114,600	114,846	88,112	85,997	85,491	95,051	966,529	961,976	922,854	1,068,940	1,104,087	1,120,271	10.66%	13.32%	13.69%	14.21%	8.78%	8.45%	8.26%		
BellSouth-Tennessee	151,053	187,031	177,448	150,471	127,421	130,288	128,262	1,452,372	1,517,598	1,590,307	1,683,691	1,740,318	1,808,330	1,824,100	11.61%	14.06%	12.58%	9.94%	7.90%	7.76%	7.56%		
Carolina Tel & Tel of North Carolina	73,630	67,251	74,672	76,411	84,380	87,715	62,436	687,853	742,105	804,196	780,403	827,240	878,668	915,452	13.67%	11.84%	11.06%	-	-	-	-		
Central of Florida	26,045	23,231	-	-	-	-	-	208,310	219,433	-	236,365	-	-	-	-	-	-	-	-	-	-		
Central of Texas	-	-	-	-	-	-	-	-	-	-	-	153,513	154,428	160,264	-	-	-	-	-	-	-		
Central Tel Co. NC Divn-NCVA	17,248	15,112	20,269	15,199	17,737	21,233	18,392	142,145	155,024	161,249	178,686	182,124	194,578	201,805	13.81%	10.80%	14.38%	9.30%	10.79%	12.25%	10.03%		
Central Tel of Illinois	22,471	24,694	23,896	17,306	-	-	-	142,996	156,219	161,623	146,088	-	-	-	18.64%	18.78%	17.35%	13.52%	-	-	-		
Central Tel of Nevada Divn.-Nevada	29,934	26,564	35,452	30,936	46,685	49,883	37,823	262,206	288,586	339,952	368,401	400,049	449,120	468,104	12.89%	11.41%	11.84%	12.16%	13.21%	12.49%	8.79%		
Central-Virginia	22,410	19,040	20,931	19,457	21,537	22,526	16,238	170,933	178,788	193,181	201,256	211,896	221,801	230,527	15.09%	11.92%	12.15%	10.70%	11.31%	11.30%	7.58%		
CINCINNATI BELL	99,884	166,442	133,763	104,899	119,697	-	-	597,388	617,133	648,870	670,116	712,127	-	-	-	20.08%	36.93%	25.97%	18.56%	20.20%	-	-	
Cincinnati Bell - Kentucky	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cincinnati Bell - Ohio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Citizens Ca - Sheets	11,781	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Citizens NY - Red Hook	306	1,183	1,030	2,542	1,204	1,795	1,655	-	4,350	8,280	10,039	9,598	11,380	13,275	11,954	10.93%	7.57%	16.67%	11.43%	36.03%	11.83%	15.84%	
Citizens NY - Upstate	9,314	35,558	32,158	45,837	26,903	32,809	29,323	78,558	159,176	166,202	165,711	174,104	200,312	181,022	14.41%	13.45%	28.76%	23.64%	38.24%	19.91%	15.99%		
Citizens NY - Western Counties	521	3,790	3,426	4,809	3,375	3,335	3,092	10,340	20,246	20,134	19,247	20,051	21,421	20,758	5.31%	23.03%	20,51%	33.31%	20.24%	18.44%	17.50%		
Contel/Arizona	1,724	(1,421)	594	669	934	1,340	1,071	8,045	6,774	7,772	8,149	8,651	9,965	9,982	27.27%	-17.34%	8.28%	8.94%	12.10%	17.60%	12.44%		
Contel/California	67,126	39,401	30,609	29,923	31,918	7,648	(6,376)	336,024	309,260	311,553	293,651	263,411	288,913	268,736	24.96%	14.50%	10.90%	11.35%	13.79%	2.72%	2.32%		
Contel/Nevada	7,378	1,290	1,598	2,014	2,156	873	174	-	20,080	19,667	23,590	23,283	24,510	24,536	25,503	58.09%	7.02%	7.27%	9.47%	9.64%	3.69%	0.66%	
GTE NW-Contel-Oregon	1,591	-	-	-	-	-	-	-	-	-	-	-	-	-	8.73%	-	-	-	-	-	-		
GTE NW-Montana	571	-	-	-	-	-	-	2,760,407	2,625,309	2,727,708	2,935,749	3,077,568	3,091,193	2,990,178	-	-	-	-	-	-	-		
GTE/California	312,717	377,267	288,085	263,025	292,692	99,608	13,434	40,222	42,488	45,308	47,854	43,056	46,710	-	12.67%	16.78%	11.81%	9.84%	10.51%	3.33%	0.45%		
GTE/Contel Systems of Iowa	4,792	5,946	5,047	8,238	(62)	1,932	-	58,790	62,544	61,204	61,845	64,034	61,547	-	13.53%	16.27%	12.54%	20.79%	-0.19%	4.31%	-		
GTE/Contel-Iowa	7,403	5,237	8,302	5,008	5,979	4,219	-	67,060	91,593	88,718	93,670	91,165	88,819	-	4.75%	6.35%	18.66%	9.46%	5.60%	7.07%	-		
GTE/Iowa	3,951	5,466	13,954	8,099	4,838	5,881	-	30,020	31,919	34,257	35,510	39,334	38,580	-	18.90%	18.86%	15.65%	10.06%	9.98%	4.26%	-		
GTE/Nebraska	4,772	5,065	4,636	3,245	3,570	1,584	-	3,224,006	3,364,845	3,553,986	3,715,358	3,983,905	4,322,326	4,560,927	-	11.68%	-	-	-	-	-	-	
Illinois Bell	453,647	269,325	329,771	374,293	223,923	130,972	222,760	1,169,670	1,282,154	1,399,370	1,496,809	1,605,361	1,747,477	1,830,852	-	12.67%	16.78%	11.81%	9.84%	10.51%	3.33%	-	
Indiana Bell	165,234	93,624	108,920	107,745	84,377	69,941	72,857	2,608,546	2,025,216	3,154,540	3,301,532	3,396,020	3,580,526	3,597,505	-	13.53%	16.27%	12.54%	20.79%	-0.19%	4.31%	-	
Michigan Bell	379,012	244,126	267,890	269,290	189,580	103,797	170,864	172,077	178,593	188,939	198,128	212,588	189,594	201,139	-	14.41%	13.05%	15.69%	8.98%	10.30%	7.36%	-	
Nevada Bell	21,682	22,441	25,135	27,993	44,457	32,541	36,967	1,515,372	2,191,305	2,213,839	2,291,872	2,342,635	2,398,573	2,487,852	-	14.42%	13.47%	15.34%	16.65%	26.44%	20.72%	-	
Ohio Bell	324,572	189,077	202,563	213,585	165,352	174,698	181,721	201,687	215,373	219,105	221,977	229,346	236,566	247,800	-	16.38%	8.70%	10.23%	11.26%	5.98%	3.12%	5.13%	
Pacific Bell - California	16,777	7,110	8,420	10,018	9,727	13,890	12,657	116,361	123,797	147,601	143,488	157,169	151,829	151,829	-	16.85%	6.09%	6.05%	7.51%	6.60%	6.60%	9.11%	
Puerto Rico Telephone - Puerto Rico	59,899	74,833	90,862	-	-	-	-	843,705	969,831	1,027,927	-	-	-	-	7.64%	8.36%	9.70%	-	-	-	-		
Puerto Rico Telephone - Puerto Rico Central	164,080	158,100	177,576	204,150	227,342	204,386	247,882	1,169,670	1,282,154	1,399,370	1,496,809	1,605,361	1,747,477	1,830,852	-	16.00%	14.07%	14.53%	15.79%	16.50%	13.25%	15.64%	
Puerto Rico Telephone Company	168,740	187,481	196,524	-	227,143	257,836	247,356	302,161	1,512,623	1,592,280	1,729,736	1,859,382	1,942,864	2,062,699	2,212,976	-	14.26%	13.35%	12.82%	13.92%	15.30%	13.63%	15.81%
Qwest-Arizona	32,554	31,676	36,445	38,851	41,637	36,354	38,026	266,646	274,092	298,161	29												

Overhead Analysis Based on Account Totals as Reported by ARMS

	Executive, Planning and General & Administrative						Total Operating Revenues						Ratio							
	1994	1995	1996	1997	1998	2000	1994	1995	1996	1997	1998	2000	1994	1995	1996	1997	1998	1999	2000	
Verizon - Contel SO-Michigan	2,176	1,303	1,515	2,246	3,324	1,869	2,836	26,893	27,631	30,017	30,227	28,999	30,176	30,152	8.80%	4.95%	5.32%	8.03%	12.95%	6.60% 10.38%
Verizon - Florida	152,619	165,758	141,581	120,138	142,828	64,141	100,867	1,210,063	1,312,433	1,410,513	1,490,499	1,616,016	1,670,905	1,644,636	14.43%	14.46%	11.16%	8.77%	9.68%	3.99% 6.53%
Verizon - New England - Maine	94,365	72,832	74,261	82,073	63,005	44,585	45,420	450,175	444,190	476,830	465,847	530,206	527,048	509,881	26.52%	19.61%	18.44%	21.39%	13.49%	9.24% 9.78%
Verizon - New England - Massachusetts	445,440	388,968	380,200	442,319	422,544	226,058	258,336	2,642,848	2,720,898	2,925,536	2,882,481	2,975,991	2,853,386	2,943,555	20.27%	16.68%	14.04%	18.13%	16.55%	8.56% 9.62%
Verizon - New England - New Hampshire	82,583	75,322	72,486	75,370	72,875	41,788	41,976	470,971	489,852	529,737	534,426	542,299	517,573	522,118	21.26%	18.17%	15.85%	16.42%	15.52%	8.78% 8.74%
Verizon - New England - Rhode Island	64,349	55,412	47,068	50,228	65,515	28,720	31,868	350,017	361,997	391,542	389,497	409,131	390,405	383,046	22.46%	18.07%	13.06%	14.38%	19.07%	7.94% 9.07%
Verizon - New England - Vermont	48,230	38,745	39,524	39,840	32,380	21,032	21,653	236,849	213,533	253,092	253,331	268,009	257,264	256,031	25.57%	22.17%	18.51%	18.66%	13.73%	8.90% 9.24%
Verizon - New York Telephone	1,445,940	1,201,212	912,419	94,247	1,092,824	1,146,474	908,138	7,830,562	7,889,156	7,910,197	7,852,852	8,131,136	8,283,029	8,189,357	22.65%	18.01%	13.04%	13.87%	15.53%	16.06% 10.95%
Verizon Hawaii	94,268	92,771	79,110	60,561	74,283	26,908	15,237	538,089	557,538	579,414	572,761	596,465	590,686	551,406	21.24%	19.81%	15.81%	11.82%	14.23%	4.77% 2.84%
Verizon MO-Contel-Missouri	20,870	26,653	23,074	9,813	21,186	13,480	(1,849)	206,799	208,208	206,892	203,333	215,742	224,224	215,794	11.17%	14.68%	12.55%	5.07%	10.89%	6.40% -0.85%
Verizon MD-Missouri	4,372	10,652	11,015	17,426	10,222	9,531	3,883	74,494	86,271	84,644	94,080	92,753	101,594	93,054	6.23%	13.94%	14.96%	22.73%	12.39%	10.35% 4.35%
Verizon NO-Contel-Illinois	16,602	17,716	16,930	11,144	10,840	4,000	1,525	120,260	112,507	113,902	120,929	125,412	124,081	123,077	16.02%	18.69%	17.48%	10.15%	9.48%	3.33% 1.25%
Verizon NO-Contel-Indiana	7,326	13,090	10,186	7,237	10,256	2,361	1,578	110,103	106,083	107,645	113,520	124,941	136,069	133,008	7.13%	14.08%	10.45%	6.81%	8.94%	1.78% 1.20%
Verizon NO-Contel/Pennsylvania	5,324	7,735	4,835	8,238	5,291	1,030	2,798	38,407	35,475	39,822	42,409	49,108	43,859	44,775	16.09%	27.88%	13.90%	24.11%	12.08%	2.42% 6.67%
Verizon NO-Contel/Quaker State	2,235	1,155	2,625	(1,683)	3,381	1,001	1,678	25,478	26,146	23,896	25,195	32,692	30,906	29,067	9.62%	13.41%	6.95%	11.53%	3.35%	6.13% -0.00%
Verizon NO-General Offices	(1,282)	20	(34)	53	(11)	-	6	11,190	15,245	17,948	14,887	(22)	-	-	-10.28%	0.13%	0.19%	0.36%	100.00%	-10.00% -10.00%
Verizon NO-Illinois	42,344	54,050	60,710	25,835	47,135	22,849	5,093	387,683	416,464	428,982	457,559	466,498	449,455	474,300	12.26%	14.91%	16.49%	5.98%	11.24%	5.36% 1.09%
Verizon NO-Indiana	67,178	80,226	68,233	55,292	45,697	22,729	12,452	499,803	521,292	555,083	588,051	607,584	622,902	582,059	15.90%	18.19%	14.02%	10.36%	8.13%	3.79% 2.19%
Verizon NO-Michigan	48,386	58,969	53,585	24,429	47,229	13,582	9,197	421,726	446,256	467,369	491,568	485,666	485,810	470,141	12.98%	15.23%	12.94%	5.23%	10.77%	2.88% 2.00%
Verizon NO-Ohio	56,799	80,780	57,304	36,826	55,288	27,184	16,233	544,082	559,036	574,183	584,250	591,844	570,805	569,242	11.43%	16.89%	11.09%	6.69%	10.30%	5.00% 2.94%
Verizon NO-Pennsylvania	37,187	42,587	39,712	15,871	36,260	13,536	7,803	286,105	294,851	316,915	326,796	326,901	362,713	359,540	14.94%	16.88%	14.33%	5.10%	12.13%	3.88% 2.22%
Verizon NO-Wisconsin	31,218	37,524	34,388	17,487	30,148	10,491	3,127	290,130	294,578	305,646	315,590	314,152	337,891	304,854	12.10%	14.57%	12.68%	5.87%	10.62%	3.20% 1.04%
Verizon NW-Idaho	10,772	7,425	8,803	7,968	8,109	3,217	2,568	90,778	94,832	111,164	113,017	112,880	118,478	115,514	13.46%	8.51%	8.60%	7.59%	7.74%	2.79% 2.27%
Verizon NW-Oregon	28,264	31,305	30,567	26,790	31,205	13,014	13,231	252,026	290,690	310,123	341,638	346,866	360,035	355,535	12.63%	12.07%	10.93%	8.51%	9.89%	3.75% 3.87%
Verizon NW-West Coast California	74,904	72,726	62,012	52,861	57,356	29,053	27,865	488,630	539,172	550,066	594,731	629,567	678,470	668,348	19.03%	15.59%	12.71%	9.71%	10.02%	4.47% 4.32%
Verizon NW-Washington	1,171	3,415	2,076	2,861	1,212	508	527	8,889	10,363	13,883	19,668	18,002	13,886	11,545	15.17%	49.15%	17.58%	15.65%	7.22%	3.80% 4.78%
Verizon SA-Alabama	11,395	27,722	12,287	13,800	14,932	7,720	8,412	109,889	114,501	123,169	138,939	133,683	140,160	143,641	11.57%	31.95%	11.08%	11.03%	12.58%	5.83% 6.22%
Verizon SA-Contel-Kentucky	8,203	4,629	7,110	5,794	6,920	3,005	3,322	57,986	66,273	70,228	73,631	73,446	78,348	76,486	16.48%	7.51%	11.26%	8.54%	10.40%	4.03% 4.43%
Verizon SA-Contel-North Carolina	10,331	6,758	7,472	8,566	9,227	3,452	8,438	78,914	77,110	84,835	85,959	90,568	94,904	95,002	15.08%	9.61%	9.68%	11.07%	11.34%	3.77% 9.75%
Verizon SA-Contel-South Carolina	656	1,135	1,885	1,454	1,962	850	894	13,393	14,519	14,719	15,546	17,844	19,706	20,568	5.18%	8.48%	12.93%	10.32%	12.35%	3.39% 3.49%
Verizon SA-Contel-Virginia	47,466	45,049	38,673	37,648	37,803	20,911	21,116	325,803	350,382	383,374	406,964	430,541	383,588	404,212	17.05%	14.75%	11.22%	10.19%	9.63%	5.77% 5.51%
Verizon SA-Illinois	2,775	5,054	2,553	1,624	2,826	607	1,462	24,197	22,973	24,158	24,855	26,509	24,849	25,664	12.95%	49.15%	17.58%	15.65%	7.22%	3.80% 4.78%
Verizon SA-Kentucky	33,826	40,500	30,993	21,398	31,626	20,465	16,831	303,358	329,858	343,520	358,161	371,554	394,228	391,067	12.47%	14.00%	9.92%	6.39%	9.30%	5.48% 4.44%
Verizon SA-North Carolina	20,528	12,114	22,506	14,380	18,243	13,125	10,585	169,547	161,408	185,720	203,183	234,886	243,938	239,286	14.77%	8.11%	13.79%	7.62%	8.43%	5.69% 4.63%
Verizon SA-South Carolina	13,332	19,243	14,388	12,376	14,672	8,597	7,992	121,675	135,926	142,322	143,273	154,814	159,819	156,908	12.31%	16.49%	11.25%	9.45%	10.47%	5.68% 5.37%
Verizon SA-Virginia	2,270	3,638	4,169	4,452	4,865	3,331	3,712	24,388	24,698	25,453	27,758	35,856	26,956	24,354	10.27%	17.27%	19.59%	19.10%	14.96%	14.10% 17.98%
Verizon SW-Arkansas	7,931	12,016	6,239	4,870	9,447	3,188	-	61,655	68,028	68,012	75,674	62,264	77,714	-	14.71%	21.11%	10.10%	6.88%	12.97%	4.25% 4.25%
Verizon SW-Contel-New Mexico	26,270	18,376	17,943	13,046	18,144	7,351	(1,059)	-	43,340	38,217	42,463	39,951	38,180	-	28.24%	10.10%	6.85%	14.80%	6.99%	-0.92% -0.92%
Verizon SW-Contel-Texas	3,529	4,802	3,183	263	3,149	2,913	-	29,910	26,122	30,225	31,776	35,858	36,363	-	13.38%	20.04%	11.77%	8.08%	9.63%	8.71% 8.71%
Verizon SW-Texas	11,211	8,897	7,630	2,802	7,911	3,524	-	76,579	68,234	69,944	73,234	79,586	74,302	-	17.15%	14.99%	12.24%	3.98%	11.04%	4.98% 4.98%
Verizon Contel of Eastern Missouri	401	(483)	523	406	140	177	(1)	1,039,928	1,115,009	1,217,117	1,274,020	1,383,313	1,388,483	1,358,743	14.39%	16.28%	12.83%	9.62%	11.05%	9.58% 5.79%
Verizon Contel Systems of Missouri	4,386	3,826	3,188	3,180	3,144	1,594	(720)	40,344	39,497	40,139	40,140	39,308	38,683	30,447	8.68%	-9.18%	19.49%	31.53%	13.68%	5.34% -0.03%
Verizon Delaware	25,901	29,875	27,839	26,681	27,920	23,898	29,441	256,528	259,178	277,041	263,895	297,838	298,964	275,825	12.20%	13.03%	11.17%	12.20%	11.27%	8.72% 10.53%
Verizon Maryland	156,962	161,045	206,432	161,264	178,161	145,323	160,782	1,935,312	2,009,906	2,126,351	2,035,793	2,117,215								